REMARKS

Fig. 5 has been corrected so as to overcome the Examiner's objection.

The Examiner has stated with regard to the drawings that the description refers to an additional injection of fuel into the Diesel engine. This is correct. But it is also said two paragraphs earlier that the increase in the exhaust gas temperature can also be generated by oxidation of fuel injected into the NO_x store. Fig 5 as amended nevertheless indicates now the injection of additional fuel into the diesel engine – although this is difficult to show as required by the Examiner – since merely an increased amount of fuel is supplied through the normal injectors when additional fuel is injected into the engine.

In the newly submitted claims 20 – 27, the language of the description has been used in order to overcome the Examiner's claim rejections under 35 USC 112, that is, to avoid any objections that the recited language is not disclosed in the specification. Specifically, the features of the new claims are disclosed in the description as follows:

Claim 1:

The features concerning the functions of the control unit and the sensor arrangement: page 4, lines 34 – page 5, line 14 and page 10, lines 1 – 6.

The arrangement of the particle filter, nitrogen oxide store and oxidation catalytic converter – see page 4, lines 27 – 33; page 5, lines 15 – 20, see also original claim 3.

For the features concerning the sulfur and soot regeneration and the combination of the two procedures see page 2, lines 30 – 30, page 3, lines 28 – 35; page 7, lines 4 – 10, page 8, lines 1 – 5, page 8, lines 12 – 25. For the temperature range of the exhaust gas for the regeneration procedure see page 2, lines 30 – 33, page 7, lines 4 – 6, lines 13 – 16, page 8, lines 8 – 11.

Claim 21: see page 3, lines 6 – 10, page 9, lines 35 – 37.

Claim 22: see page 7, lines 4 – 6, page 9, lines 13 – 15, lines 36 – 37.

Claim 23: see page 7, lines 21 – 25

Claims 24, 25, 26: see page 4, line 37 – page 5, line 14.

Claims 27: see page 3, lines 11 – 14, original claim 4.

With regard to the Examiner's objections to the capitalizing of the term "Diesel", it is noted that Diesel is the name of the inventor of the Diesel engine and as a name and, furthermore, out of reverence for this great inventor, Rudolf Diesel, the undersigned would prefer to capitalize the word. To comply however with the Examiner's requirement the word has been changed in the claims to "diesel".

As to the rejection of claims 10 – 18 under the 35 USC § 103, the Examiner has cited Khair et al. (6,293,096) and WO 00/21647 (claims 10 – 18) Strehlau et al. (6 089 015) or Held (6 531 099) (claim 19) and EP 835, 684 (claims 1 – 18).

Khair et al. (6 293 096) discloses an exhaust gas treatment system wherein the NO_x in the exhaust gas stream is oxidized in a first stage oxidation catalytic converter to NO_2 and subsequently directed to an NO_x trap wherein NO_2 is reduced to N_2 by fuel injected into the exhaust gas stream upstream of the NO_x trap. Carbon is oxidized in a carbon trap disposed downstream of the NO_x trap.

WO 00/21647 discloses a process and apparatus for treating exhaust gases which includes a particle filter with a nitrogen oxide storage device arranged downstream of the particle filter and an oxidation catalytic converter arranged upstream of the particle filter.

Neither of these two references is concerned with the regeneration of sulfur, that is, the removal of the sulfur compounds from the nitrogen oxide store. Only the regeneration of the particle filter by the oxidation of soot by means of NO_2 is mentioned. This process however is often insufficient to prevent the clogging of the particle filter by soot over time. Furthermore, with the deposition of sulfur compounds in the NO_x storage device, the storage device is slowly deactivated and finally becomes inactive.

This problem is solved in the diesel engine exhaust system according to the present invention in that a control unit is provided which controls the regeneration procedure at increased temperatures in such a way that a particle filter regeneration by the removal of the collected soot and, in combination therewith, a sulfur regeneration of the nitrogen oxide store is achieved. This ensures a long-time effectiveness of the nitrogen oxide store and also of the particle filter with a relatively small frequency of activation of the energy consuming regeneration procedures.

Since neither US 6 293 096, nor WO 00/21647 disclose or suggests the sulfur regeneration of the nitrogen oxide store in combination with a soot regeneration of a particle filter at a raised temperature, the invention as defined in amended claim 1 is not only novel but can certainly not be considered to be obvious from either, or a combination, of the two references.

EP 835 684 A2 has already been discussed in Applicants' response dated 02/05/05. The Examiner's allegation that the second catalytic converter of EP 835 684 A2 may be considered to be a particle filter is not believed to be appropriate. This reference discloses only the removal of soot which has been unintentionally deposited on the second catalytic converter (column 1, line 41 – 43). This certainly does not suggest a soot filtering function of the second catalytic converter. It rather suggests the contrary, that is, that soot should not be deposited in the second catalytic converter, but can be removed if accidentally deposited. The second catalytic converter can therefore certainly not be considered to be a particle filter.

But, in any case, no sulfur regeneration is considered in contrast to the arrangement as defined in the new main claim 20.

The subject matter of new claim 20 is not anticipated by any of the references US 6 293 096, WO 00/21647, EP 835 354 A2, nor will any combination of the references lead to the arrangement as defined in new claim 20, so that the subject matter of claim 20 cannot be considered to be obvious from the cited references.

Of the two references US 6 089 615 and US 531 099, which were additionally cited by the Examiner with regard to claim 19 (as submitted with the preliminary amendment of 09/15/05), US 6 089 015 concerns a diesel engine with an exhaust gas cleaning system which includes a permanent reduction catalytic converter 3, and, downstream thereof, a nitrogen oxide storage catalytic converter.

US 6 531 099 discloses an oxide gas absorbing arrangement for an internal combustion engine which includes a nitrogen oxide storage device for which sulfur regeneration (removal) may be provided at temperatures above 500°C by heating the exhaust gas by injecting and burning additional fuel in the exhaust gas.

Neither US 6 089 015, nor US 6 531 099 discloses a diesel engine with an exhaust gas purification arrangement which includes a particle filter. The subject matter according to

claim 20 is therefore also novel with regard to US 6 089 015 and US 6 531 099, (which were actually cited by the examiner only to show the presence of various sensors to be known).

In any case, claim 20 as presented herewith is clearly novel and as shown above, is also unobvious in view of the cited references so that it should be patentable.

Reconsideration of claim 20 is respectfully requested.

Claims 21 – 27 are all dependent on claim 20 and, consequently, include all the features of claim 1.

As a result, they are certainly also novel and should be patentable together with claim 20.

Reconsideration of the dependent claims 21 – 27 is also requested and allowance of claims 20 – 27 is solicited.

Respectfully submitted,

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